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THE CHINCH-BUG IN IOWA.—A bulletin of the Iowa Agricultural College, by Professor Osborn, entitled *The Chinch-Bug in Iowa*, has just been issued. It includes a summary of the habits of the species and a discussion of some experiments in controlling this pest.

EMBRYOLOGY.

THE "VENTRAL SUCKERS" OR "SUCKING DISKS" OF THE TADPOLES OF DIFFERENT GENERA OF FROGS AND TOADS.[1]—Thiele in this very interesting paper, shows that the singular sucker-like organs found behind the mouth and under side of the head in the tadpoles or larvæ of frogs and toads differ widely in form in different genera. They are clearly for the purpose of enabling the young larvæ to attach themselves to various fixed bodies in the water, such as weeds, the gelatinous egg-strings and masses from which they have been hatched, etc. They are thus afforded support and prevented from sinking into the ooze to smother, and their enemies thus also doubtless find them a less ready prey. These disks are also shown by Thiele not to be of the nature of suctorial organs, but are glandular, being formed wholly of thickened epidermis which is elevated, its cells becoming lengthened or columnar. There is no muscular suctorial apparatus developed in connection with them, and they are secretory, secreting a sticky mucus or slime which serves to fasten the young tadpole to its resting place. That an actual secretion is formed is proved by the fact that a slimy thread of secreted matter is drawn out from the disk if the young tadpole be forcibly withdrawn from its support. They are specifically larval organs, and persist only for one to two weeks after hatching. They may be compared to the "balancers" found behind the mouth in the larva of *Amblystoma*. In *Triton* stalked suckers are said to be present, which Balfour compares to the sessile "suckers "of larval toads and frogs. But the present writer cannot see how it is possible to homologize the sucking disk of larval gar pikes with the adhesive organs in larval Batrachians, because in the former the disk is in front of the mouth and in the latter it is usually quite behind the mouth, only in one case (Hyla) are the suckers found near the angle of the mouth. The larva of *Xenopus* has two long barbels at the side of the head from the sides of the upper lip. But in this last case even, it is doubtful if there is any homology with the "suckers" of other larval *Anura*. There certainly cannot be any homology between the organ of the gar-pike's larva and that of young toads and frogs, though it is probable that these organs in the latter are truly homologous with the "balancers" of the larvæ of salamanders of the type of *Amblystoma* and *Triton.*

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[1] Der Haftapparat der Batrachierlarven, von Johannes Thiele. Zeitsch. f. wiss. zool. xliv. pp., 67–79, pl. x. 1887.

Thiele further shows that inasmuch as these structures are glandular with no muscular apparatus, that the terms "sucker" or "sucking disk" are misnomers as applied to these organs. A better term might be proposed for these structures in young tadpoles, and the writer would suggest that they be called *epidermal adhesive organs.*

The form of these organs differ widely in different genera of *Salientia* and will afford a valuable means of identifying the larvæ. In *Discoglossus pictus*, the adhesive organ behind the mouth is hemispherical, with a V-shaped groove on its surface, the V opening forward. In *Pelobates fuscus* the adhesive organ is Y-shaped with a Y-shaped groove on its surface and the limbs of the whole organ extending forward to embrace the angles of the mouth. In *Bufo vulgaris* the organ is V-shaped, with a V-shaped groove, and the limbs of the V come into contact with the angles of the mouth. In *Bufo viridis* the organ is cresent-shaped, not in contact with the mouth, but a little behind it, as in *Discoglossus,* and with a widely open V-shaped groove. In *Rana esculenta* and *R. fusca* there are two distinct oval adhesive organs on either side of the median line with traces of a V-shaped groove connecting them, and both are behind the mouth. In *Rana agilis* there are two separate adhesive organs, one on each side behind the mouth, and each has a slight depression on its posterior border. In *Hyla arborea* there are two circular adhesive organs close to the angles of the mouth at either side. In *Bombinator igneus* there are two oval adhesive organs behind the mouth, which are in close contact, and later on fuse into a single organ, both having an oval depression in the centre.—*J. A. R.*

PSYCHOLOGY.

THE COPE-MONTGOMERY DISCUSSION.—*The Theism of Evolution.*—The following is offered as a synopsis of the leading opinions maintained by the writer in a series of articles furnished by him to *The Open Court* during 1887, in reply to articles written by Dr. Edmund Montgomery:—

I. PRINCIPIA.

1. In the universe there exist both mind and matter, subject and object.

2. The evidence for the existence of mind is found in consciousness; first, of ourselves, and, second, of other living beings, whose motions, identical with those which we make under the influence of our own consciousness, convince us of their possession of it.